

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q78966

Tamami KOYAMA, et al.

Appln. No.: 10/581,727

Group Art Unit: 2811

Confirmation No.: 8717

Examiner: Not yet assigned

Filed: June 5, 2006

For: POLYMER FOR ANODE BUFFER LAYER, COATING SOLUTION FOR ANODE BUFFER LAYER,  
AND ORGANIC LIGHT EMITTING DEVICE

**SUBMISSION OF ENGLISH TRANSLATION OF EXAMINATION REPORT ON  
PATENTABILITY**

**MAIL STOP AMENDMENT**

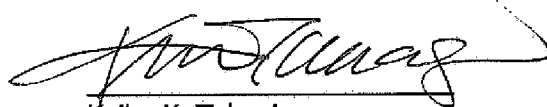
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

For the Examiner's convenience, enclosed herewith is a copy of an English translation of the International Examination Report on Patentability dated July 27, 2007, received in reference to the above-identified application.

It is noted that the three (3) references cited in the Report were previously listed on the PTO/SB/08 form submitted with the Information Disclosure Statement filed in the U.S. Patent and Trademark Office on June 5, 2006.

Respectfully submitted,



Keiko K. Takagi  
Registration No. 47,121

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: August 9, 2007

**Bescheld/Protokoll (Anlage)****Communication/Minutes (Annex)****Notification/Procès-verbal (Annexe)**

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Date 27.07.2007  
Date

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Anmelde-Nr.:  
Application No.: 04 807 027.0  
Demande n°:

The examination is being carried out on the following application documents:

**Description, Pages**

1-34 filed with entry into the regional phase before the EPO

**Claims, Numbers**

1-11 filed with entry into the regional phase before the EPO

**Drawings, Sheets**

1/2, 2/2 filed with entry into the regional phase before the EPO

Reference is made to the following documents; the numbering will be adhered to in the rest of the procedure:

- D1: PATENT ABSTRACTS OF JAPAN vol. 1998, no. 10, 31 August 1998 (1998-08-31) - & JP 10 140141 A (SHOWA DENKO K.), 26 May 1998 (1998-05-26)
- D2: WO 87/05914 A (THE REGENTS OF THE UNIVERSITY OF CALIFORNIA) 8 October 1987 (1987-10-08)
- D3: WO 01/18888 A (3M INNOVATIVE PROPERTIES COMPANY) 15 March 2001 (2001-03-15)

**1. Novelty (Articles 52(1) and 54(2) EPC)**

- 1.1 An International Preliminary Report on Patentability has already been drawn up for the present application in accordance with the PCT. The deficiencies mentioned in that report give rise to objections under the corresponding provisions of the EPC.
- 1.2 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1 and 5 is not new in the sense of Article 54(1) and (2) EPC.
  - 1.2.1 Document D1 discloses a conductive microgel dispersion containing a self-doping conductive polymer with Brønsted acid groups as substituents having a dopant function in the molecule and having a chemical structure of a sulfonated benzene ring represented by the formula 1 of D1 (wherein R<sup>1</sup> to R<sup>4</sup> are each H, or a 1-20C alkyl, alkoxy, alkyl ester, a halogen, nitro, cyano, a trihalomethyl, or phenyl group; 0.01 ≤ m ≤ 0.5; M is H<sup>+</sup>, NR<sup>5</sup>R<sup>6</sup>R<sup>7</sup>R<sup>8+</sup>, PR<sup>5</sup>R<sup>6</sup>R<sup>7</sup>R<sup>8</sup>



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$^+$ ,  $As^5R^5R^7R^8^+$ ,  $Na^+$ ,  $Li^+$ , or  $K^+$ ; and  $R^5$  to  $R^8$  are each H, a 1-30C alkyl, or an aryl). The microgel dispersion, which is regarded to be a coating solution, may contain at least one surfactant in order to improve its film-forming properties (e.g. applicability) in its application to an article. Said article can be any surface in the field of electronic industry and includes electrodes (i.e. anodes and cathodes) in display devices, nonlinear optics elements and others. The pH-value of the polymer in aqueous solution is between 3 and 7 (pH = 5.0, cf. par. 37, 39).

Reference is made to the abstract and to paragraphs 1, 35-40, 50 and 51 of the patent application.

1.2.2 Document D2 discloses conducting self-doped polymers comprising a  $\pi$ -electron conjugated system of monomer units along it's backbone; 0.01-100 mole % of the monomers are covalently linked to a Brønsted acid, i.e. sulfonated heterocyclic rings are detailed. Also disclosed are the homo- and copolymeric, and zwitterionic forms of the polymer, the preparation of a polyaniline and of the corresponding zwitterionic polymer, and of methylthiophene-3-(2-ethanesulphonate) and -(4-buthanesulphonate) for the preparation of conducting polymers. Also electrodes for use in electrochemical cells, comprising a conductive substrate coated with said polymers or their zwitterionic form is disclosed. In D2 an analogy of polyaniline self-doped polymers and polythiophene polymer derivatives is made.

1.2.3 Document D3 discloses organic electronic devices (in particular OLEDs) having a conducting self-doped polyaniline buffer layer; organic light emitting diodes with anode buffer layers comprised of conducting polymer having no mobile counterions are disclosed.

1.3 Dependent claims 2 to 4 and 6 to 8 do not contain additional technical features being relevant for the assessment of novelty, and at present also appear to lack novelty in the sense of Articles 52(1) and 54(2) EPC.

## **2. Inventive Step (Articles 52(1) and 56 EPC)**

2.1 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claim 9 does not involve an inventive step in the sense



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of Article 56 EPC.

- 2.2 With respect to the lack of novelty objection raised for independent claims 1 and 5, as well as the dependent claims 2 to 4 and 6 to 8 these claims automatically lack inventive step.

As far as independent claim 1 pertaining to OLEDs is concerned, D1 does not disclose OLED devices with the abovementioned (cf. 1.2.1) polymer of 5-sulfoisothianaphthene-1,3-diyl, which has a pH value in aqueous solution between 3 and 7. Consequently, independent claims 9 - 11 represent novel subject-matter in the sense of Article 54(2) EPC.

- 2.3 However, claim 9 lacks inventive step in the sense of Article 56 EPC.

The objective technical problem to be solved underlying the subject-matter of the independent claim 9 consists in the provision of OLED devices with an improved stability (i.e. delay of the deterioration of the light emitting layer).

- 2.3.1 In D1, the improved stability of a conductive self-doped polymer layer at a pH between 3 and 7 has been demonstrated (cf. paragraph 51) and the combined teaching of D2 and D3 gives an incentive for a skilled person to exchange the polyaniline self-doped polymer in the anode buffer layer by the 5-sulfoisothianaphthene-1,3-diyl polymer.
- 2.3.2 Consequently, the comparative tests provided in the present application (cf. page 34, table I) are not suitable to demonstrate any unexpected effect or property which could not be expected by a person skilled in the art.

- 2.4 Dependent claims 10 to 11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC in respect of inventive step.

### 3. Other deficiencies

- 3.1 Independent claims 1, 5 and 9 are not in the two-part form in accordance with Rule 29(1) EPC, which in the present case would be appropriate, with those features known in combination from the prior art (documents D1 through D3) being placed in the preamble (Rule 29(1)(a) EPC) and with the remaining features being included in the characterising part (Rule 29(1)(b) EPC).

New independent claims, which are still to be filed unambiguously pertaining to novel and inventive subject-matter should therefore be redrafted accordingly. If, however,



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- the applicant is of the opinion that the two-part form would be inappropriate, then reasons therefor should be provided. In addition, the applicant should ensure that it is clear from the description which features of the subject-matter of new independent claims replacing current independent claims 1, 5 and 9 are already known in combination from the documents D1 through D3 (see the Guidelines, C-III, 2.3b).
- 3.2 To meet the requirements of Rule 27(1)(b) EPC, the documents D1 and D2 should be identified in the description and its relevant contents should be indicated. The applicant should ensure that it is clear from the description which features of the subject-matter of the independent claims are known from these documents and document D3.
- 3.3 The applicant is invited to file new claims which take account of the above comments. Amendments should be made by filing replacement pages. Unnecessary recasting of the description should be avoided. An amended abstract is not required. The applicant should also take account of the requirements of Rule 36(1) EPC. If handwritten amendments are submitted, they should be clearly legible for the printer. According to the decision of the President of the EPO under Rule 35(2) EPC (OJ EPO 12/2001, 563) one set of the amended documents of the European patent application shall be provided.
- 3.4 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant should clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see Guidelines E-II, 1).  
If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.
- 3.5 When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims. Care should be taken during revision, especially of the introductory portion and any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed (Article 123(2) EPC).